

Streamlines



Newsletter of the New Hampshire Volunteer River Assessment Program

July 2007

New Hampshire Department of Environmental Services Watershed Management Bureau

2006 Program Overview

Welcome to the second edition of *Streamlines*, the annual newsletter of the New Hampshire Volunteer River Assessment Program (VRAP).

In 2006, VRAP supported 24 volunteer groups on numerous rivers and watersheds throughout the state. Each year VRAP has continued to grow both in terms of the number of groups participating and the amount of useable data that is collected.

During 2006 VRAP worked to continually improve the program in its ability to collect quality environmental data as well as the services the program provides to the volunteer groups participating.

Two hundred fifty-four stations were monitored by VRAP volunteers in 2006. This monitoring effort generated a total of 8,583 instantaneous data points useable for state water quality assessment purposes.

In addition to instantaneous measurements, NHDES and VRAP volunteers utilized multiparameter dataloggers and water temperature dataloggers to collect more detailed information on dissolved oxygen, pH, specific, conductance and/or water temperatures. These dataloggers generated an additional 88,650 datapoints.

NHDES staff and volunteers from the Hodgson Brook Advisory Committee successfully installed a stream gage to be used by volunteers to generate flow data. NHDES helped develop a rating curve for the gage that would be used to translate stream gage readings into discharge data useable for pollutant loading calculations.

VRAP also initiated a pilot winter monitoring program. The goal of this program was to collect specific conductance and chloride data during winter and snowmelt months to document the impact of road salt on rivers and streams.

In 2006 the VRAP program collected more data and monitored more stations than in any previous year. The program continues to develop and expand, while maintaining the quality assurance/quality control processes that form the core of the program. VRAP volunteers are invaluable in protecting and preserving New Hampshire's rivers and streams and for being local stewards who help educate the community regarding the importance of good water quality. We are looking forward to continue growth and development in 2007.

Jen Drociak & Ted Walsh

Introducing Chelsea Martin 2007 VRAP Assistant



I began working for VRAP in June 2007 after graduating from the University of Vermont where I majored in Environmental Science and minored in Environmental Studies.

I gained field experience working with the Department of Fisheries at the University of Vermont, and UVM Watershed Alliance.

In my spare time I enjoy hiking, running, and swimming. I enjoy winter activities such as skiing and snowshoeing.

I look forward to working with you in 2007!

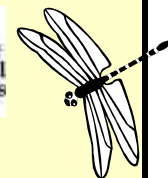
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2007 Annual VRAP Volunteer Training Workshops

During April, May and June, VRAP organized 13 annual training workshops. Training workshops were held in Rochester, New Boston, Claremont, Portsmouth, Franklin, Keene, Rollinsford, Littleton, Epping, Exeter, Webster and Warner. Two hundred twenty three volunteers attended the events. Topics included:

- Calibration and meter checks.
- Quality assurance and quality control.
- Sample collection for field and laboratory analysis.
- Order of field tests.
- Sampling techniques.
- Water quality parameters and state standards.

Each VRAP group was given a bound copy of “*Water Quality Monitoring Field Sampling Protocols for Volunteer Monitors*” and several copies of the 2007 field data sheet. Each attendee was given a copy of the protocols, the 2007 field data sheet, and the “*Interpreting VRAP Water Quality Parameters*” fact sheet.

We hope that these annual VRAP refresher training workshops and handouts were helpful to both the group leaders and other volunteers. Please remember to schedule an annual field visit for 2007.

Have You Scheduled an Annual Field Visit?

Contact the VRAP Staff Today!

Jen Drociak

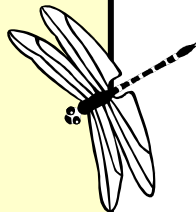
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A Field Guide to Common Riparian Plants of NH

In October of 2006, VRAP published “*A Field Guide to Common Riparian Plants of New Hampshire*.” The guide is currently available only online in PDF format at www.des.nh.gov/wmb/vrap/documents/FieldGuideToCommonRiparianPlantsOfNH.pdf.

The full-color field guide was created for both VRAP volunteers and others to assist in identifying common native and non-native riparian plant species. Over 70 plant species are described in the text, with additional live specimen scans and habitat photos.

The field guide is organized into six sections:

1. **In the Water: Submerged Aquatic Plants.** Plants that have most of their leaves growing under water; some floating leaves may also be present. They are found from shallow to deep zones.
2. **On the Edge: Emergent Herbaceous Plants.** Plants that have leaves that extend above the water’s surface and are usually found in shallow water.
3. **Ferns.** Non-flowering plants that bear spores rather than seeds with flattened leaf-like “fronds” that are further divided.
4. **Woody Shrubs.** Woody plants that are generally shorter than trees and smaller in trunk size. They have clusters of stems rising directly from the ground and generally have a “bushy” appearance with no special crown shape.
5. **Climbing Vines.** Plants with a weak stem that derive support from climbing, twining, or creeping along a surface.
6. **The Canopy (Trees).** Woody plants that usually grow from the ground with a single erect stem or trunk. The main stem may be massive and is often unbranched for several feet above the ground. Trees can reach a considerable height at maturity.

The author is also available to present a complementary and interactive presentation entitled “*A Virtual Field Guide to Common Riparian Plants of New Hampshire*” to your group or organization. This presentation will also be expanded to include a two-hour workshop at the 2007 Watershed Conference (see page 9 for more information). Please contact Jen Drociak, at (603) 271-0699 or jdrociak@des.state.nh.us for additional information.

Winter 2007 Chloride/Specific Conductance Sampling Project

By: Ted Walsh

This winter a number of VRAP groups participated in a pilot project to begin sampling our rivers and stream during the winter and snowmelt months to monitor chloride and specific conductance levels.



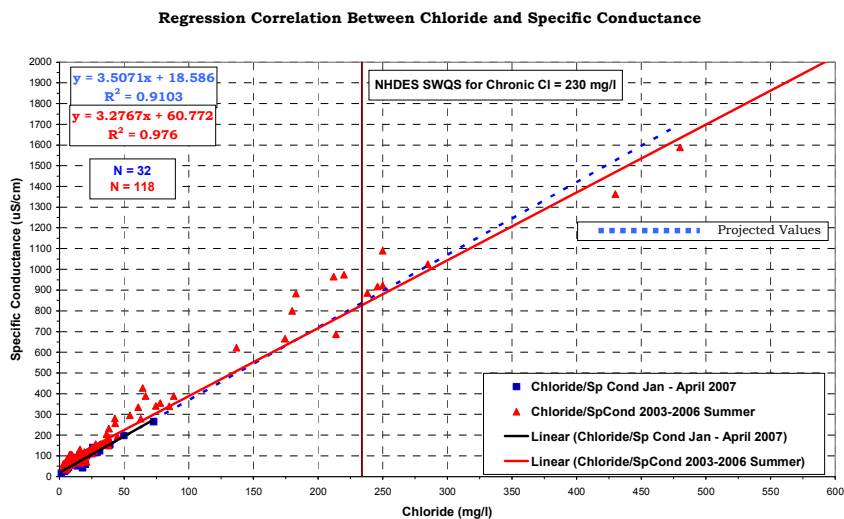
Volunteers from the Israel River VRAP group take part in the chloride/specific conductance sampling project.

Although chlorides can originate from natural sources, most of the chloride that enters the environment is associated with the storage and application of road salt. Road salt readily dissolves and enters aquatic environments in ionic forms. Chloride containing compounds such as halite (road salt) commonly enter surface water, soil, and groundwater during snowmelt events. Chloride ions are chemically conservative, which means they

are not degraded in the environment and tend to remain in solution once dissolved. Chloride ions that enter groundwater will ultimately reach surface waters and influence the aquatic environments of our rivers and lakes. NHDES and the VRAP program sought to gain a better understanding of what the background chloride levels are in our rivers and streams during the summer months and what levels are reached during snowmelt events when chloride levels are most likely at their highest.

Chloride levels are very closely correlated with specific conductance levels (Figure 1). NHDES has worked to develop a regression model between chloride and specific conductance levels that would allow one to predict chloride levels in a river or stream based on specific conductance measurements. Data collected by VRAP volunteers during the winter of 2007 and previous summer VRAP data indicated that the chronic chloride standard is correlated to a specific conductance level of approximately 850 $\mu\text{S}/\text{cm}$.

The VRAP program will be working to incorporate winter specific conductance and chloride sample into the monitoring programs of all VRAP groups with the goal of gaining a better understanding of what the current impacts are on our rivers and streams.



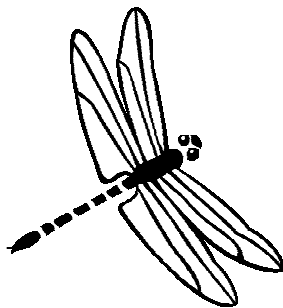
Designation of the Ammonoosuc River

By: Laura Weit, Assistant Planner, NHDES Watershed Management Bureau

In March of 2006, the Ammonoosuc Corridor Advisory Committee and the town of Littleton nominated a 44.8 mile segment of the Ammonoosuc River for designation into the New Hampshire Rivers Management and Protection Program (RMPP). During the two-year-long nomination process, 33 letters of public support were submitted with the nomination to NHDES. No opposition from any group or individual was received during this time. The Rivers Management and Advisory Committee (RMAC) and NHDES reviewed and approved the nomination and in January of 2007, NHDES forwarded the nomination to the legislature in a report to the General Court. House Bill 61, nominating segments of the Ammonoosuc River into the RMPP was signed into law by Governor Lynch on June 11 and will go into effect on August 10, 2007.

The Ammonoosuc River is located in northwestern New Hampshire in the upper Connecticut River watershed. It begins at Lake of the Clouds on the western slopes of Mount Washington and flows west, north and southwest for 60 miles through the communities of Carroll, Bethlehem, Littleton, Lisbon, Landaff and Bath until it reaches its confluence with the Connecticut River at Woodsville in the town of Haverhill.

The designation begins from the White Mountain National Forest boundary near Lower Falls in Carroll and continues until it reaches its confluence with the Connecticut River in Haverhill.



A number of river-related values and characteristics may qualify a river for designation into the RMPP. Encircled by the natural beauty of the area, residents and tourists enjoy swimming, fishing, camping, hiking, hunting, photographing, picnicking and canoeing. Woodsville Precinct obtains its drinking water directly from the river and the town of Lisbon obtains its drinking water from gravel packed wells located right on the river's edge. The Ammonoosuc River Valley is currently in the middle of a development boom and there is growing concern about the impact these changes and the resulting fragmentation might have on water quality, wildlife, stream bank erosion rates, access, and the quality of the recreational experience on the river.

For more specifics on the Ammonoosuc River Nomination, please visit

www.des.nh.gov/rivers/nominations.htm.



The Ammonoosuc River

Hodgson Brook Stream Gage Pilot Project

By: Ted Walsh

Beginning in March 2006, NHDES and Hodgson Brook volunteers partnered on a pilot project establishing a volunteer flow monitoring station as part of the Hodgson Brook restoration plan. Flow is a measurement of the volume of water moving past a fixed point in a unit of time. It is typically measured in cubic feet per second (cfs). In order to determine what the flow is, one must know the cross sectional areas of the stream at a given location and the velocity of that water moving past that cross section. Flow has many impacts on water quality including water temperature, dissolved oxygen levels, the concentration of pollutants, and habitat for fish and macroinvertebrates. The site specific records of flow conditions generated by the stream gage are also valuable in conducting pollutant loading analysis.

On March 27, 2006 NHDES installed a staff gage on Hodgson Brook in Portsmouth. The staff gage was graduated to hundredths of feet and marked every tenth and whole foot. Five site visits were conducted for the purpose of measuring flow and five useable data points were generated in the development of a rating curve. In order for the stage readings to be converted to flow or discharge data the relationship between stage and flow must be established.



On May 14 the Seacoast experienced a significant flood event, and flows in many locations exceeded the 100 year flood level. The volume of water was enough to damage the gage beyond further use.

In the spirit of perseverance NHDES and the Hodgson Brook VRAP group installed a new staff gage at the same location. From June through December 2006 NHDES staff and Hodgson Brook volunteers conducted 17 site visits to measure flow to establish a rating curve on the new gage.

The purpose of the site visits were to develop a rating curve, which is an empirical

representation of the relationship between stage and flow. A rating curve is developed by making a series of stream flow measurements at different gage heights. The development of an accurate rating curve is critical as it allows volunteers to read the stream gage and then easily convert those gage heights to a corresponding stream flow.



Natalie Landry, NHDES, measures depth and velocity in Hodgson Brook in Portsmouth

On each occasion when flow was measured, depth and velocity readings were taken at intervals across the width of the river. The full dataset was then used to determine the stream flow for the corresponding gage height during the site visits. A stage reading combined with a simultaneous flow measurement provides one point useable in the development of the rating curve. Of the 17 flow measurements taken since June 15, 12 met quality assurance/quality control

(QA/QC) requirements and are usable for the development of the rating curve. When the depth profile is combined with velocity data, the flow of the river can be established.

The figure below depicts a regression model of the rating curve that was developed from the four useable discharge/stage height readings that were measured on the first gage and the 12 useable discharge/stage height readings that were measured on the second/current gage. The regression model shows a good relationship between stage height and discharge for both gages (1st gage $R^2 = 0.9963$) (2nd gage $R^2 = 0.9148$). The slopes of the two rating curves are very similar, indicating that the rating curve for the current gage is reliable. Due to the strong relationship developed between stage height and flow, stage height readings taken by volunteers can now be accurately converted to flow readings.

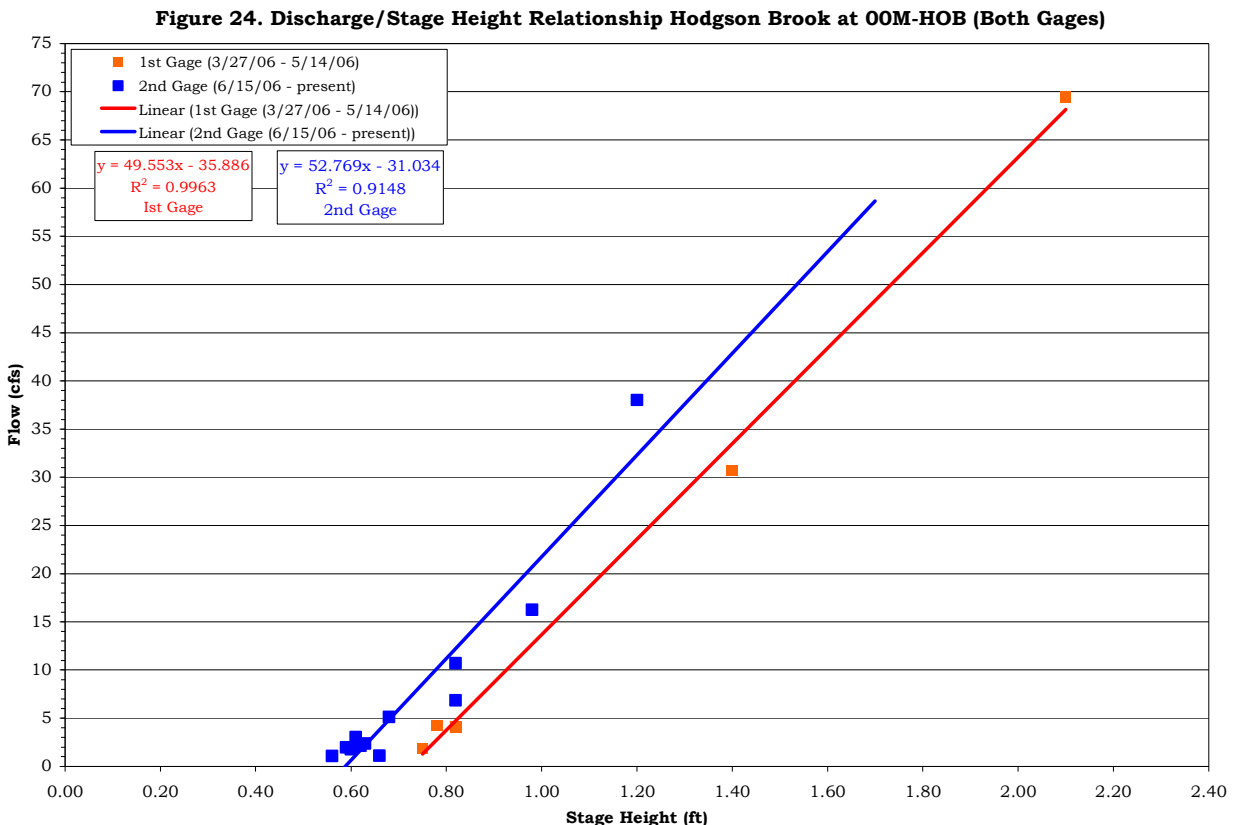
The conversion from stage height to flow would be done using the following formula:

$$Y = 52.769X - 31.035$$

Where: X = Gage height (in feet)
Y = Flow/Discharge (in cubic feet per second or cfs)

The relationship between stage and discharge is only accurate for those stage readings within or close to the range that was measured during the development of the rating curve. Also, the relationship in the rating curve is only useable under ice free condition. It is not feasible to measure high flow in this location with the equipment and techniques used in this project due to safety concerns. However, the model depicted in Figure 24 would be useable for a majority of flow conditions.

NHDES and Hodgson Brook VRAP group have already installed two more gages in the Hodgson Brook watershed and volunteers will be trained to read the gages and report the data back to NHDES. These stream gages will be very useful in determining pollutant loading to Hodgson Brook with the ultimate goal of working towards restoring this important urban waterbody.



The Volunteer Program Partnership: How to Retain and Appreciate Volunteers

By: Jen Drociak

Many VRAP volunteers are also coordinators of individual VRAP groups and are charged with recruiting and maintaining volunteers on an annual basis. Below are some helpful hints for recruiting, coordinating and retaining volunteers.

Who are Volunteers?

Volunteers range in age from young children to retirees and everyone in between! They are doctors, lawyers, teachers, engineers, working professionals, students and others. Many live near a lake/pond, or river/stream and are generally concerned about water quality.

How Do Volunteers Get Involved?

Individuals can become involved in volunteer groups through local conservation commissions, lake associations, river management advisory committees, and other groups. Individuals can also become involved through program websites, newsletters, “networking” conferences/workshops, friends and family.

Why Do Volunteers Get Involved?

In general, volunteers donate their time and energy according to their specific talents, interests and experience. They typically bring a unique contribution toward supporting the progress of the group’s goals.

Volunteers may either have a desire to conserve or preserve existing water quality conditions, or to collect baseline water quality data in areas where little to no data exist, in order to eventually determine trends and identify pollution sources for restoration potential. Volunteers may also aim to effect change at the local and/or state level and have a sense of community/civic duty. Some volunteers are simply interested in becoming more educated and thus educating others in the process.

All volunteers should be made to feel valued, appreciated and recognized. Prior to employing the assistance of volunteers, selection of tasks and time commitment required should be well defined.

When there is a general interest and talent on behalf of the volunteer, there is a better chance of success and efficient completion of assigned tasks. Volunteers are also motivated by acknowledging their value to the group and task at hand.

Benefits of Partnering with Volunteers

Volunteer monitoring efforts supplement state monitoring efforts. In doing so, volunteers provide for the ability to collect additional data, and to collect data in more geographic locations. Since volunteers typically monitor their waterbody every year, state agencies can provide trend analysis on data and would otherwise be unable to do so. In the process of volunteering, individuals also become interested and educated in their waterbodies/watersheds thus becoming its “eyes” and “ears” and hopefully becoming long-time stewards. Volunteers also provide a link between state and local government by means of their conservation commissions, and planning and zoning boards.

Becoming a Successful Volunteer Coordinator

It takes skill to unite volunteers in a common goal and effort. As a coordinator, it is important to be aware that volunteers need to be heard, understood, and appreciated for what they contribute as individuals.

Some factors to consider when partnering with individual volunteers are their age, background, interests, concerns, and level of experience. Other considerations may include safety concerns or liability issues (age, weather, topography, meters/chemicals, etc.), as well as time commitments. In group settings, some individuals may need more assistance while others are sufficient and can be “group leaders”. It is also important that all individuals in a group must learn to work as a

team and be a “team player” in order to collect useful data.

When considering the task(s) at hand consider what needs to be completed and who is most capable at doing what. Assign tasks to individuals based on their interests and comfort level. Remember to balance the role of the coordinator (educating) with the role of the volunteer (learning) in order to accurately and efficiently collect useful data.

Another factor to consider is the relationship between the volunteer coordinator and the volunteer. Needs between the two should always be balanced when implementing a local sampling plan and considering “data-driven decision-making”. Remember, the partnership is a two-fold relationship dynamic, that is, the volunteer and the program coordinator work for each other (volunteer collects data; program coordinator helps assess/report and guide with local decision-making).

Appreciate Volunteers

When volunteers are acknowledged and appreciated, they are much happier to

contribute their time and talent to the mission of the group.

Some ways to retain volunteers are to keep tasks interesting and informative, provide them with new opportunities and experiences (continue to challenge them so they don't tire of the same task!), offer educational experiences/networking opportunities (such as a website, newsletter, publications of interest, conferences, and workshops), and acknowledge and reward volunteer contribution by certificates of appreciation, awards, and social events.

Remember, regardless of an individual's or group's motivation for volunteer monitoring — whether it is to improve community planning decisions, to do their part in protecting the local environment, or to protect their own investment in property adjacent to a waterbody — the end result is the same: volunteers play an integral role in protecting and improving the quality of New Hampshire's lakes, ponds, rivers and streams!

A presentation on this topic will also be given at the 2007 Watershed Conference. For more information see below.

Mark Your Calendars: 2007 Watershed Conference

Interest in the annual Watershed Conference has grown tremendously! We look forward to another successful conference for 2007, which will be held on Saturday, November 17th from 8 a.m. to 4 p.m. at the New Hampshire Technical Institute.

A record number of people (194 watershed stakeholders) attended the 2006 event. In 2007 the workshops, presentations and camaraderie you have grown to love will remain the same!

The Watershed Conference allows you to join peers from local river management advisory committees, volunteer monitoring groups, lake association, watershed associations, municipalities, conservation commissions, and non-profits to attend information workshops, exchange innovative river and watershed ideas, view displays from lake and river organizations throughout the state and come away with a renewed enthusiasm and a world of knowledge to put toward protecting the aquatic resources you love!

If you missed out on the 2006 conference, you can view its proceedings, as well as those for the 2003 and 2004 conferences, at www.des.nh.gov/WMB/WatershedConference/.

For more information, visit www.des.nh.gov/WMB/WatershedConference/ or contact Laura Weit, at (603) 271-8811 or lwiet@des.state.nh.us.



10 Steps Toward Conducting a Successful Clean-Up Event

By: Jen Drociak, NHDES VRAP Coordinator and Manchester Urban Ponds Restoration Program Coordinator

Since 2000, the Manchester Urban Ponds Restoration Program (UPRP) has been coordinating spring and autumn clean-ups at seven ponds within the city. From 2000-2006 the UPRP organized 52 clean-up events. To date, over 200 volunteers have spent 836.5 hours collecting 622 bags of trash! This “trash” does not include illegally “dumped” items such as shopping carts, tires, car batteries, car parts, construction debris, and other items. In addition, the value of volunteer time spent at these clean-ups equals more than \$16,000 over the years!

Your volunteer group can take the following 10 steps toward a successful shoreline clean-up event.



1. Partner with Existing Organizations

Some of the best volunteer attendance has been through partnerships with existing organizations. Form partnerships and advertise your clean-up event with local high school biology or ecology clubs, community college or university extracurricular programs, or existing local groups who may take an equal interest in your event.

2. Gather Needed Supplies —

Partner with Municipal Departments & Local Businesses

Partnering with municipal departments such as your parks and recreation department, and/or highway department can allow you access to tools and services at no expense. For

example, the Manchester Parks and Recreation Department has been providing the UPRP with plastic refuse bags, gloves, rakes and other tools for clean-up events. Similarly, the Manchester Highway Department has been continuously removing and weighing the trash collected at each clean-up event.

Contact local businesses for donations such as supplies, beverages and snacks and/or prizes. Local businesses may also be able to provide donations towards printing or copying informational flyers or costs associated with advertising in local newspapers, radio or television spots.

3. Advertise!

Advertise your clean-up event in several ways. Create an e-mail list of potential volunteers and send information to those on your list. This information can also be forwarded to other potentially interested individuals. Post clean-up event date(s) and information on your lake association and municipal website. Place an advertisement on your community access television and in local papers. Post clean-up event date(s) and information on local kiosks around the lake at public spaces such as parks and boat ramps.

4. Have Participants Sign-In and Track Volunteer Time

To account for the number of participants in attendance, and to create (or add to) either an e-mail or mailing list, create a sign-in sheet and have volunteers provide their contact information. Be sure to track volunteer hours of each participant so that volunteer time and the value of volunteer time in in-kind match can be accounted for at the end of the event. The value of volunteer time can be found and calculated by visiting www.independentsector.org.

5. Educate Participants

When volunteers arrive, educate them about the status of your lake or pond. Have a brief discussion regarding some of the issues facing your lake or pond, and the importance of not

only maintaining the water quality of the lake or pond itself, but the quality of the watershed as a whole.

6. Practice Safety and Dress Appropriately

Remember to educate participants on the importance of safety during the clean-up event. Encourage participants to wear latex or work gloves while collecting refuse. Remind volunteers to keep to the immediate shoreline and not to wade into the water without assistance. Keep a first aid kit on hand in case of an emergency. In addition, encourage participants to dress appropriately for the weather and situation. Individuals who may be wading in water should be equipped with knee-boots or waders.



7. Keep Track of What You Find

During your clean-up event, you will most-likely find recyclable typical items such as aluminum, glass, and plastic bottles, as well as non-recyclable items such as candy wrappers, snack packages, and cigarette butts. Depending on the location, you may

also find illegally dumped items such as tires and car batteries. To keep track of what you find, have participants or groups separate recyclables, or count items found. At the end of the clean-up event, weigh the trash to obtain number of pounds removed from the shoreline or in-lake areas.

8. Document the Event

Take photos of volunteers during the clean-up event and a group photo (around the trash collected) afterwards to document the event, and publicize future events.

9. Keep it Interesting and Reward Volunteer Participants

Turn the clean-up event into a scavenger hunt for children and award prizes for “Most Interesting Object Found,” “Most Cans Collected,” or “Largest Item Retrieved.” Be creative!

10. Acknowledge Volunteer Contribution

After the clean-up event, send a personalized Thank-You card or create and send a Spirit of Community Certificate of Appreciation to each participant.

Good Luck!

For more information on the Manchester Urban Ponds Restoration Program, visit www.manchesternh.gov/urbanponds or e-mail urbanponds@gmail.com



How to Conduct a Storm Drain Stenciling Event

By: Barbara McMillan, NHDES Watershed Assistance Outreach Coordinator



A storm drain stenciling event is a method to provide public outreach utilizing children, students, or adult volunteers. With the assistance of your local department of public works, storm drain stenciling can be performed by local camps, schools,

volunteer organizations, or businesses in targeted neighborhoods throughout a town or city. If children, local organizations, or businesses are involved, they can provide a draw for press coverage.

A key component in making a storm-drain stenciling event effective is providing a watershed education program to volunteers prior to stenciling. In addition, whenever possible, try to involve other members of the community. For instance, place door hangers on homes in the neighborhood on the day of the stenciling. Another way to increase community awareness is to issue a press release before the event.

Lastly, obtain signed permission slips for children before they participate in activities. Storm drain stenciling is a great way to get attention and coverage of stormwater pollution issues, and the outreach will leave a lasting mark! The stencil should stay on the ground for at least a few months so that every person who sees it will become more aware about their impacts on water pollution and storm drains.

Materials

- Adult volunteers – 1-2 per group of 3-5 children.
- Storm drain stencils – 1-2 per group
- Maps with storm drains outlined
- Spray paint or DPW line paint
- Paint buckets and brushes for under age nine – one per group

- Clipboard for maps
- Pencils – one for each group
- Gloves – one pair per volunteer
- Safety vests– one per volunteer
- Traffic cones– 2-3 per group
- Broom and dustpan – one per group
- First aid kit – one per group
- Paper towels – one roll per group
- Hand cleaning solution – one per group
- Garbage bags – one per group
- Camera – one for event

Method

1. Before Getting Started: Contact the Local Department of Public Works for assistance with your storm drain stenciling project. You will need their permission to apply the paint, and they are an essential partner for your program — possibly providing storm drain maps, traffic cones, safety vests, and additional guidance. Decide who you will target for your volunteers, (i.e., school groups, scouts, clubs, camp groups, YMCA, businesses, volunteer organizations, after school groups, etc.). Consider the ages that you would like to work with and can handle for the neighborhood size, number of storm drains you are trying to stencil, and the

Why Stencil Storm Drains?

- To educate a neighborhood or community on the water quality impacts and other hazards of dumping waste materials into storm drains.
- To involve young people in an educational community service project.
- To help solve an illegal dumping problem that has been detected in a neighborhood or community.

Who Gets Involved?

- School groups
- 4-H clubs, scouts or other youth groups
- Citizen volunteer monitoring groups and watershed improvement groups
- Stormwater programs and public utilities

amount of time you will have with the volunteers.

2. Planning Your Event: Identify a contact person for the organization you want to target and meet with him/her to confirm interest in participation. Work with your contact to plan a date, as well as a rain date in case weather does not permit stenciling. Use storm drain maps provided by the local DPW for planning your event. Consider allowing about ½ hour to ¾ hour for getting organized, stormwater education, and stenciling training. Time for actual stenciling depends on how far volunteers need to walk and their age. Be sure to invite the media to attend.

3. Stormwater Pollution and Pet Waste Awareness Training: You can provide education about stormwater pollution and pet waste on the day of stenciling or a date before the event.

4. Getting Started: On the stenciling day, divide the volunteers into groups of two to three people. Assign a chaperone or staff member to each group under age 16. Ensure each group has a kit with the necessary materials (paint, broom, dust pan, clip board, storm drain map, garbage bags, paper-towels, first aid kit, and traffic cones), and all members of the group are wearing vests. Demonstrate one storm drain stenciling

procedure to the entire group, and review helpful hints to stencil.

5. Stenciling Procedure:

- Locate your storm drain.
- Place a traffic cone in the road to alert traffic of your presence.
- Select the area that will be stenciled so that passersby will see it.
- Clear off debris and sand around the storm drain with your broom and dustpan.
- Place the stencil on cleared area and spray it with the spray paint in a quick, even sweeping motion.
- As each drain is completed, make a note on the map.

Summary

Storm drain stenciling can be a great way to raise awareness about nonpoint source pollution in communities. There is potential for press coverage on the day of the event to raise awareness in the community, the volunteers learn about stormwater pollution, and the stenciling itself lasts! For months to come, people will be reminded that they can positively impact water quality by keeping storm drains as clean as possible by not dumping pollutants near or in them.

Estimated Storm Drain Stenciling Costs

Item	Cost Per Item	Item Total
Stencils**	\$15 x 6	\$110 (w/ S+H)
Whisk Brooms	\$4.69 x 3	\$14.07
Wire Brushes	\$1.49 x 3	\$4.47
Disposable Gloves	\$1.99 x 3	\$5.97
Spray Paint	\$3.50 x 6 cans	\$21.00
Safety Vests	Loan	0
Traffic Cones	Loan	0
	Total	\$155.51

*All costs calculated for three groups of three volunteers

**Non-custom stencil design--Custom design at "small additional cost" Earthwater Stencils LTD



Weed Woes in the River Flows

By Amy P. Smagula, NHDES Exotic Species Program Coordinator

When the topic of exotic aquatic plants arises, most people automatically tend to associate things like milfoil, fanwort, and other species with lakes and ponds. This assumption however, can be quite incorrect, particularly since the reality of the issue is that exotic aquatic plants do very much exist in rivers and streams. Each year we have cataloged new infestations in river segments throughout the state. Currently the Contoocook, Cocheco, Suncook, Merrimack, Connecticut, Nashua, and Piscataquag Rivers all support exotic aquatic plant infestations.

Some of these rivers, including the Cocheco, Merrimack, Suncook, Contoocook and Piscataquag only have one exotic aquatic plant. In each of these, variable milfoil is the problem species. For rivers like the Nashua River and Connecticut River, there are many exotic aquatic plants that co-exist. The Nashua River is plagued with infestations of fanwort, variable milfoil, water chestnut, and curly-leaf pondweed. The Connecticut River has Eurasian water-milfoil, curly-leaf pondweed, and two invasive water naiad species.

The Piscataquag River is one of the most recent rivers to succumb to the impacts of exotic plants. During the summer of 2006, a riparian land owner sent in a fragment of milfoil for identification by NHDES. The plant was hardy, lush, and green in the river near the landowner's home. DNA analysis verified that the plant was indeed variable milfoil. We suspect that the milfoil in the headwater pond to this river, Scobie Pond (a.k.a. Haunted Lake) in Frankestown was the cause of this infestation.

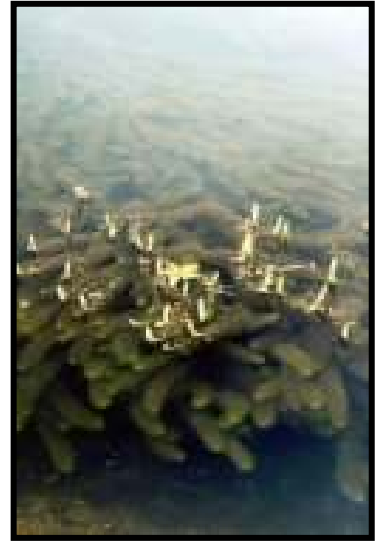
Variable milfoil was found in Scobie Pond in 2003, and quickly began sending fragments around the pond, and downstream over the

dam. In one year's time, the rooted infestation in the pond doubled, and in the next year doubled again, with increasing numbers of fragments floating downstream into the Piscataquog River.

At this point we are uncertain as to the full extent of the infestation in the river. We do know of points along the river in Goffstown, including in the Glen Lake impoundment, and at the confluence of the Piscataquag and Merrimack Rivers. NHDES plans to fully map the river from Scobie Pond to the Merrimack River in the summer of 2007, and to develop a long-term management plan for the river and its watershed.

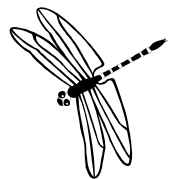
The Piscataquag River is only one example of this rapid spread of exotic aquatic plants. River systems can very quickly convey vegetative fragments and seeds from one area to another, resulting in rapid dispersion and colonization of exotic aquatic plants.

We strongly encourage all groups and individuals working on rivers to begin a regular program such as becoming involved in the NHDES Weed Watcher Program to find and document new and existing infestations of exotic aquatic plants. For more information about Weed Watching, or exotic aquatic plants in general, visit www.des.nh.gov/wmb/exoticspecies, or contact Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us.



*"To stick your hand into the river is to feel the cords
that bind the earth together in one piece."*

- Barry Lopez



Troubleshooting in the Field: What to do if...

By: Jen Drociak

Things don't always go as planned or as smoothly as they could once you're in the field. Supplies can run-out, electronic meters can be fickle, or other things can happen that can cause frustration. Below are some common occurrences and probable solutions to help you through your sampling day.

General

■ **You run out of deionized (DI) water and/or Kimwipes. What do you do?**

If you run out of DI water and there is a store nearby, you can purchase and use distilled bottled water. If there is not a store nearby, at each station be sure to thoroughly rinse the probe of each meter by pouring water from the small sample container over the probe prior to placing the probe in the larger sampling bucket. Similarly, if you run out of Kimwipes, simply ensure you thoroughly rinse the probes before sampling and please do not use tissues.

■ **The meter is “dead” and won't turn on. What do you do?**

Check the batteries. Either they are not in place, they're not in the correct polarity, or there is low battery voltage. Check the battery polarity and/or replace the batteries.

Turbidity

■ **The turbidity meter is producing suspect calibration values and/or erroneous readings. What do you do?**

If the turbidity meter is producing suspect calibration values, you may have a misaligned (or dirty/scratched) calibration standard vial, the calibration standards may be contaminated, or the internal meter components may be wet. Check, clean, and realign the calibration standard vial. If the turbidity meter is still producing erroneous readings, the measurement may have been accidentally taken with the lid open. Close the lid and read again.

pH

■ **Oops! You accidentally spilled the “electrode storage solution”. What do you do?**

Your kit should contain a replenishing supply. If it does not, you may store the pH electrode probe in 7.0 buffer until you can obtain the proper storage solution. **DO NOT** store in DI water, as this will pull the electrodes out of the probe thus damaging it.

■ **You have an Orion 210A. Sometimes you get error codes “E-20”, “E-22”, and “E-23”. What do these mean and how do you proceed?**

E-20 is an error code for “Out of Range”. If this occurs when electrodes are out of solution, the error code should disappear when electrodes are returned to solution. You should also verify the electrodes are properly connected to the meter. The sample may also be out of range, so check a buffer or standard. Recalibrate using fresh buffers and standards.

E-22 is a calibration standard error. This means that the mV being measured are the same for two different standards or buffers, and usually occurs if you accidentally attempt a two-point calibration (7.0/4.0 standards) on only one standard. Check that two different standards or buffers are being used and that the correct one is being measured. Use fresh standards or buffers and repeat the last calibration point or entire calibration.

E-23 is a bad slope error. Repeat calibration using fresh buffers or clean electrodes and refill reference electrode.

■ **The pH meter is producing unstable readings. What do you do?**

If you are getting unstable readings, there may be insufficient reference electrolyte in the electrode or it may be dirty or broken. Fill the electrode with reference electrolyte, clean the electrode with DI water and a Kimwipe, and recalibrate with the cleaned probe.

- **You accidentally forgot to calibrate the meter prior to taking a sample. Is the data still usable?**

If all other calibration slopes are within range (92-102%), we will likely still accept this data. Ensure proper calibration procedures prior to collecting your sample at the next station.

Dissolved Oxygen/Temperature

- **The main display reads “OVER” (or “Undr”). What do you do?**

The probe current is too high (or too low) to calibrate. Check the calibration value and try recalibrating. If that does not work, replace the membrane cap and KCL solution. Wait ½ hour and re-calibrate.

- **The dissolved oxygen readings seem inaccurate. What do you do?**

The calibration altitude value could be incorrect, the probe may not be in 100% water-saturated air during the calibration procedure, or the membrane may be fouled or damaged. First, recalibrate with the correct calibration altitude value. If that does not work, place a few drops of DI water in the calibration chamber to moisten the sponge and recalibrate. As a last resort, replace the membrane cap and KCL solution, wait ½ hour, and recalibrate.

- **The readings on the main menu display do not change. What do you do?**

The meter may be in “recall” mode. Press the Mode key to return to normal operation.

Specific Conductance

- **The conductivity meter is not reading the standard accurately (*For example, it is reading the 200 $\mu\text{S}/\text{cm}$ as 100 and/or the 100 $\mu\text{S}/\text{cm}$ as 50*). What do you do?**

Ensure the conductivity probe is fully immersed in the standard, so that the “holes” on the top of the probe are also immersed. If you are still getting an erroneous reading of the standard, try using fresh standard if you have some.

- **Does the conductivity meter need to be in “Flashing C” mode?**

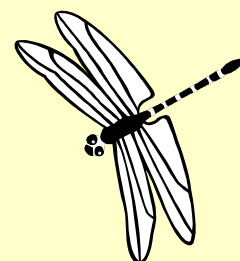
Yes. This will ensure you are measuring specific conductance, which is temperature compensated.

- **IF ALL ELSE FAILS:**

Please feel free to contact Jen Drociak at 271-0699 or Ted Walsh at 271-2083.

VRAP Sampling Tips

- Calibrate the pH and DO meters before each measurement!
- Do not turn off the DO meter until the end of the day!
- Run a replicate sample once a day!
- Test the pH 6.0 buffer, turbidity DI blank, and zero oxygen once a day!
- Check the conductivity meter with the known standard at the beginning & end of the day!
- Calibrate the Turbidity Meter with the 1.0 NTU standard at the beginning of the day and check it with the 1.0 NTU standard at the end of the day!
- Rinse everything with DI water – a lot!



The Promise and Challenge of Urban Rivers

2007 EPA and Urban Harbors Institute “Urban Rivers” Conference

The Promise



Rivers are critical to the history, identity, and livelihood of many New England cities. Though rivers have become polluted by industry and urban life, they also hold great promise for the revitalization of degraded urban environments. As water quality improves and land is redeveloped,

cities take on a new vitality. As cities manage their stormwater so runoff does not pollute the rivers, and as communities begin to invest in their rivers, new energy is given to planting trees and gardens and creating new riverfront parks. The promise in improving urban rivers in turn becomes the promise of cleaner and stronger urban environments.

The Challenge

The health of New England's urban rivers has been compromised over the last two centuries by industry, growth, and increasing population density. Our region's rivers have powered industries, leaving behind a legacy of polluted rivers and contaminated sediments. Marshlands along rivers have been filled to accommodate urban growth, leading to flooding and erosion. The high density of people living in cities has created pollution stemming from sewage and trash. Large swaths of paved surfaces have altered the flow and quality of water running into rivers. Residents have become reluctant to fish or swim in these rivers, and in some cases don't even want to live near or to reinvest in them. Many riverfront cities face the further challenge of a declining tax base, poverty, crime, and aging infrastructure, with many urban residents living with pollution and increased health risk. There is a growing urgency to clean the region's urban rivers.

While these problems are complex and challenging, they are not insurmountable.

In addition, as rivers are cleaned up, riverfront properties become increasingly more valuable. Investors can choose to partner with local watershed and municipal representatives to collaborate on cutting edge river restoration projects or promote a project that limits the opportunities to balance environmental and economic issues. The challenge is in identifying successful and just ways to clean up the region's urban rivers.

There are 22 cities in New England with populations over 50,000 and defined as environmental justice areas (low income and minority areas). This conference addressed a number of questions including:

- What resources are available to assist with urban river issues?
- What are the most promising techniques used for urban river restoration?
- What can we learn from cities who have had success with their urban rivers?
- What are the biggest challenges faced by urban communities in working on river issues?

Presentations included the following:

- *Envisioning Restoration: An introduction to urban watershed conference opportunities*
- *Complicated and Costly: What are we learning about dealing with contaminated sediments?*
- *Public Access and Urban Land Conservation*
- *Water in the City: Stormwater, illicit connections, and urban low impact development*
- *Urban River Restoration: Ecologically oriented development considering environmental justice*

For more information, visit
www.epa.gov/ne/urbanrivers

NHDES Grant Opportunities

Watershed Assistance Grants

Funds for Watershed Assistance Grants are appropriated through the NHDES Watershed Assistance Section from the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act. Grant funds are available to identify and address nonpoint source (NPS) pollution problems through watershed management, including assessment, planning and implementation. Organizations with 501(c)(3) federal tax-exempt status and governmental subdivisions including municipalities, regional planning commissions, non-profit organizations, county conservation districts, state agencies, watershed associations and water suppliers are eligible to receive Watershed Assistance Grants.

For more information, please contact Eric Williams at (603) 271-2358, or ewilliams@des.state.nh.us or Jeff Marcoux at (603) 271-8862 or jmarcoux@des.state.nh.us.

Watershed Assistance Grant Basics:

1. A project must plan or implement measures that prevent, control or abate NPS pollution.

Projects should:

- Restore or maintain the chemical, physical, and biological integrity of New Hampshire's waters.
- Be directed at encouraging, requiring, or achieving implementation of best management practices (BMPs), whether structural or non-structural, to address water quality impacts from land use.
- Be feasible, practical and cost effective.
- Provide an informational, educational, and/or technical transfer component.

2. The project must include an appropriate method for verifying project success with respect to the project performance targets, with an emphasis on demonstrated environmental improvement.

Nonprofit organizations registered with the Secretary of State and governmental subdivisions including municipalities, regional planning commissions, non-profit organizations, county conservation districts, state agencies, watershed associations, and water suppliers are eligible to receive Watershed Assistance and Restoration Grants.

Outreach & Education Grants

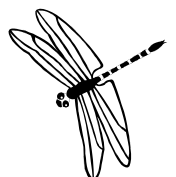
This program provides small grants of \$200 to \$2,000 for outreach and education projects relating to nonpoint source pollution issues that target appropriate audiences with diverse NPS water quality related messages. These small grants are available year round on an ongoing basis, which allows applicants to move forward with outreach and education projects without having to wait for annual application deadlines.

The NHDES Watershed Assistance Section administers the grant program using \$20,000 each year from the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act.

For more information, please contact Barbara McMillan at (603) 271-7889 or bmcmillan@des.state.nh.us

"When one tugs at a single thing in nature, he finds it attached to the rest of the world."

- John Muir



New Publications

■ Volunteer Biological Stream Data Collection Reports

These reports present biomonitoring results from the 2006 Coastal Volunteer Biological Assessment Program.

Exeter River Report

www.des.nh.gov/wmb/documents/Exeter06_VBAP.pdf

Cocheco River Report

www.des.nh.gov/wmb/documents/Cocheco06_VBAP.pdf

Oyster River Report

Hardcopies are available by contacting Sally Soule at (603) 559-0032 or ssoule@des.state.nh.us

■ Land Conservation Plan for New Hampshire's Coastal Watersheds

The plan identifies 75 conservation focus areas, which were identified through a systematic, state-of-the-art analysis of a wealth of natural resources data. Collectively, these areas comprise approximately 190,300 acres, or 36 percent of the watershed. For more information visit

www.nature.org/wherewework/northamerica/states/newhampshire/projects/art19061.html

■ New Stormwater Guidelines and Standard Operating Procedures:

Designed specifically for New Hampshire MS4 communities, this manual is the creation of commonly accepted technical standards and guidance on stormwater management measures controlling the quantity and quality of stormwater produced from municipal activities. It can help jump start communities' illicit discharge and elimination programs and provide a basis for future training of employees. Specifically, the manual addresses

two of the new control measures mandated for MS4 towns by the U.S. Environmental Protection Agency: #3 (Illicit Discharge Detection and Elimination) and #6 (Pollution Prevention/Good Housekeeping). The New Hampshire Seacoast Stormwater Coalition completed this manual with a grant from the New Hampshire Estuaries Project and NHDES as authorized by the EPA pursuant to Section 320 of the Clean Water Act. For more information visit

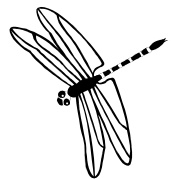
www.des.nh.gov/stormwater/.

■ Great Bay Estuary Restoration Compendium

The compendium is a tool to help communities and organizations restore eelgrass, salt marsh, diadromous fish and shellfish in the Great Bay Watershed. The compendium has two components: a report and a GIS database. The report provides maps and detailed descriptions on areas of concern to help set future restoration goals and aid project development. With the scientific backing and expertise of years of work compiled in one place, the compendium saves loads of research time and strengthens project grant proposals. The GIS database is packed with GIS data on past restoration projects, water quality issues, dam locations, and historic distribution salt marshes, fish and oysters. With ArcView users will be able to customize their own set of maps by selecting the restoration data most applicable to their projects' needs.

Visit

www.nhep.unh.edu/resources/pdf/great_bay_restoration-tnc-06.pdf to view the document online without the accompanying GIS layers. Staff from the New Hampshire Coastal Program are available to assist communities in using the compendium.



"We forget that the water cycle and the life cycle are one."

- Jacques Cousteau

Thank-You to all 2006 VRAP Volunteers!

- **Ammonoosuc:** Ginny DiFrancesco, Jan Edick, Mary Edick, Seth Goldstein, Christopher Jensen, Evan Karpf, Joan Karpf, Ray Lobdell, Vincent Lunetta, Marilyn Johnson, Carl Schalber, Richard Wally, Lon Weston, Woodsville Water and Light District
- **Ashuelot River:** Paul Daniello, Patrick Eggleston, Penny Eggleston, Joan Garuti, Jim Holley, Bob Lamoy, Carolyn MacDowell, Malcom MacDowell, Linda McCracken, Sigrid Scholz-Karabakakis, Barbara Richter, Barbara Skuly, Steve Stepenuck, Ann Sweet, Roger Sweet, Bob Thompson
- **Bellamy River:** Wendy Began, Marci Erickson, Eric Fiegenbaum, Katie Fiegenbaum, Barbara Maurer, Craig Seaver, Pam Seaver, Chris Skoglund
- **Cocheco River:** Virginia Bannon, Norma Bard, Lorie Chase, Barbara Dionne, Novella Dionne, Melodie Esterberg, David Green, Kristen Henderson, Lauren Jacoby, Peter Keefe, Bill Sammis, Cal Schroeder, Mike Suprin, Mike Walters-Echol, Jeff Winders
- **Cold River:** Mike Heidorn, Deborah Hinman, Erick Walker, Howard Weeks
- **Contoocook River:** Beth Alpaugh-Cote, Marian Baker, Dick Bell, Bob Carney, Shirley Carney, Roderick Cyr, Michelle Hamm, Ted Hillson, Richard P, Rod Rogstad, Cory Stephenson, Linda White, Rod Zwirner
- **Exeter River:** Don Clement, John Henson
- **Gridley River:** Selinda Chiquoine, Karen DeBonis, Jon VanderHorst
- **Gunnison Brook:** Bea Jillette, Cyndi Phillips
- **Hawkins Brook:** Paul Delfari, Dan MacFarlane, Ralph Pisapia, Dave Sias
- **Hodgson Brook:** Nick Ciani, Candace Dolan, Brandon Dotra, Stephanie Fardy, Sherry Godlewski, John King, Meghan Laird, Natalie Landry, Rob Ruszenas, Vickie Sargent, Sally Soule
- **Hooksett Tributaries (Brown's Brook/Peter's Brook):** Steve Couture
- **Isinglass River:** Lorie Chase, Peter Keefe, Ed Kelly, Ann Melvin, Ann Schultz, Cyndy Twombly, Ginny, Jasmine Schonwalde, Virginia Schonwalde
- **Israel River:** Beth Ball, Bob Ball, Jen Barton, Jean Cargill, Bob Christie, Bill Fischang, Peg Fischang, Jim Irish, Bruce Kirmmse, Jean Leone, Joe Marshall, Cindy Martindill, Chuck Martindill, Charles Muller, Gary Newfield, Justin Priesendorfer, Winnie Ward, White Mountain Regional High School
- **Lamprey River:** Celia Abrams, Stephanie Beck, Gile Beye, Kathleen Chamberlain, Sandy Cote, Laura Cottrell, Sam Demeritt, Greg Doane, Barbara Edgar, Paul Gallant, Catherine Gardener, Dawn Genes, Barbara Haglind, Bary Kane, Deb Kimball, Barbara Lillystrom, Terry Lipp, Ginny Lyons, Dick Lyons, Maureen McGinty, Sue Mooney, Victoria Parmele, Aida Patupaite, Shirely Savingau, Cheryl Smith, Wendy Schorr, Peter Stoupas
- **Oyster River:** Holley Baley, Julia Bellshaw, Barbara Flynn, Rita Freuder, Brian Gallagher, Ben Getchell, Harold Hocker, Jim Hornbeck, Deb Johnson, Tom Lee, Barbara Mauer, Doug Miller, Paul Pepler, Gloria Quigley, Carl Starr
- **Pemigewasset River:** Tom Anderson, Dan Paradis, Fred Gunter, Max Stamp
- **Pennichuck Brook:** Paul Johnson, Brendan O'Shaughnessey, Rob Polys, Minda Henderson
- **Piscataquog River:** Chuck Bolton, Brian Dresser, Amy Doherty, Barbara Gannon, John Magee, Tom Noel, Ray James, Addie Ann Lambarth, Katie R, Agnes Shellmer, Janet White, Megan White
- **Powwow River:** Dale Bogaski, Cornelia Courtney, Adele Fiorillo, Christine Fisher, Steve Kaneb, Larry Smith
- **Saco River:** Nancy Giroux, Arthur Higel, Nancy Oleson
- **Salmon Falls:** Benjamin Littlefield, Gail Littlefield, Katherine Littlefield
- **Smith River:** Dan Coons, Lenore Clark, Sheldon Jones, Pat Tarpey